

# A Study on the Impact of Institutional-Specific and Macroeconomic Indicators on the Non-Performing Assets of New Private Sector Banks in India

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**Abstract**— The research aims at analyzing the influence of institutional-specific and macroeconomic indicators on the non-performing assets of 7 new private sector banks in India for a period of 12 years from 2004-05 to 2015-16 using the econometric tools such as descriptive statistics, multiple correlation, augmented dickey-fuller test, granger causality and johansen co-integration test. The multiple correlation results portrayed a positive relationship for Gross Domestic Product Growth Rate (GDPGR) and Unemployment Rate (UR) whereas the Inflation Rate (IR) and Money Supply (MS) showed a negative relationship with the Gross Non-Performing Assets to Total Advances (GNPATA). The results of Augmented Dickey Fuller Test denote that the selected study variables don't have Unit Root with them. The Granger Causality Test results confirmed that all the institutional-specific variables such as CAR, CRR, PLR, SLR, RR and RRR don't granger cause the GNPATA. On the other hand, the macroeconomic variables such as IR, GDPGR and MS don't granger cause whereas the UR alone does granger cause the GNPATA. Further the Johansen Co-integration Test results confirmed the co-integration of all the institutional-specific and macroeconomic variables with the GNPATA of New Private Sector Banks.

**Keywords** — Macroeconomic, Institutional-specific, New Private Sector Banks, Explained and Explanatory Variables.

## I. INTRODUCTION

Bank plays a vital role in the development of any economy all around the world. In a developing country like India, the banks' role is said to be predominant when compared to that of the other factors contributing to the national development at the same time. Banks are the heart of all financial system in this emerging global economy as well. Anything which affects the functioning of these banks will have an immediate effect on the total financial system of a country. The Non-Performing Assets (NPAs) is a huge burden for the banks now-a-days irrespective of their nature. This study aims at analyzing the two broad factors which may have association with the NPAs, namely the Macroeconomic and Institutional-specific indicators. The macroeconomic variables considered for the study include Gross Domestic Product Growth Rate (GDPGR), Inflation Rate (IR), Money Supply (MS) and Unemployment Rate (UR) whereas the institutional-

specific variables include Capital Adequacy Ratio (CAR), Cash Reserve Ratio (CRR), Prime Lending Rate (PLR), Repo Rate (RR), Reverse Repo Rate (RRR) and Statutory Liquidity Ratio (SLR). Further, logarithm has been taken for all the variables in order to maintain uniformity in the study. The research has been carried out based on the data gathered for 12 years ranging from 2004-05 to 2015-16 from various sources such as the website of RBI, annual reports of New Private Sector banks, banking journals, etc. With this introductory note, this article is structured in the following style. The 2<sup>nd</sup> Chapter deals with the past studies followed by research design, research methodology, etc. in the 3<sup>rd</sup> Chapter. Further, the Chapter 4 is related to the research analysis part whereas the Chapter 5 puts an end by finishing with the findings, suggestions, conclusion and references of the study.

## A. REVIEW OF LITERATURE

Satyajit Dhar and Avijit Bakshi (2015) studied the factors that influence the variability of loan losses (NPAs) of public sector banks in India. The emphasis was laid on macroeconomic factors or a combined set of macroeconomic and bank-specific factors. The panel regression tool revealed that certain bank-specific factors like net interest margin and capital adequacy ratio exhibits negative and significant impact on gross non-performing advances ratio of Indian banks. The advances had a positive relationship with NPA ratio and the relationship was statistically significant also. The panel approach considered both the spatial and time dimensions of observations which revealed that banks must distillate on the variables such as advances to the SEN, NIM and CARs to rheostat the complication of loan losses. [1]. Saikat Ghosh Roy (2014) scrutinized the determinants of non-performing assets in India during the period 1995-96 to 2011-12, using the Panel Regression tool. The study consisted of 4 bank specific variables and 8 economic factors. The panel regression, fixed effect agrees assessing the influence of certain macroeconomic elements on the NPA. The result revealed by this study was comparatively in the same line to that of the study conducted in other regions also. The Indian banking sector was fronting the hassle of their asset

superiority as the GDP growth deteriorated and Indian rupee saw precipitous downgrading. The panel regression denoted that the growth in GDP, varying exchange rate and global volatility had major impact on the NPA of Indian Banking Sector [2]. Krishna Prasanna P (2014) investigated the determinants of non-performing loans in Indian banking system. The bivariate regression analysis was used to find the association of each macroeconomic variable upon the gross and net NPL ratio. The panel data modeling tool disclosed that high growth in savings and GDP results in lower NPLs whereas increase in interest and inflation rate leads to further increase in NPLs. Further it was observed that GDP at factor cost, PCI growth rate and foreign trade proxies had a negative connection with the NPLs. The multiple regression result revealed that macro-economic variables backed 52% of variations in NPLs and the rest 48% was added by bank specific factors [3]. Ali Mirzaei and Zeynab Mirzaei (2011) analyzed the bank-specific and macroeconomic determinants of profitability in the Middle Eastern banking. The results showed capital strength, liquidity and efficiency as the determinants of profitability. The dynamic model exposed a non-linear association among the size and profitability of banks. Further there was no mark of backing for the traditional SCP hypothesis as per the static model. In addition, the results revealed that the off-balance-sheet activities had a negative impact on the profitability of banks whereas the inflation didn't have any sort of impact on banks' profitability [4]. Anna P I Vong and Hoi Si Chan (2008) analyzed the determinants of bank profitability in Macao. The study mainly focused on finding the impact of bank characteristics, macroeconomic and financial structure variables on the performance of banks in Macao. The ratio analysis results showed that the most important factor having the higher effect on the profitability was capital power. This would lead to lower risk which in turn would result in increase in profitability. Further the asset quality of the banks in terms of NPA provisions resulted in negative association with the profitability of banks. The banks with lesser linkage of retail deposit performed better than that of those banks with higher level of retail deposits. In addition, it was also found that the inflation rate was the only microeconomic factor which had the affirmative association with the profitability of the banks [5]. Yuqi Li (2007) examined the determinants of banks' profitability and its implication on risk management practices. The regression analysis results revealed that the allocation for NPA had a negative association affecting the profitability of banks and the effect of liquidity on profits couldn't be determined. The healthy capital structure was declared the main influent of banks' profitability which would lead to a better functioning by reducing the cost of borrowing. Further, it was found that the macroeconomic variables such as inflation rate, interest rate and GDPGR had no association with that of the profitability of banks [6]. Abhiman Das and Saibal Ghosh (2007) inspected the determinants of credit risk in the Indian state-owned banks with the use of robust test.

The study aimed at defining the determinants of credit risk in the Indian state-owned banks macroeconomic and microeconomic variables. The results showed that the macroeconomic factors such as bank growth rate, GDP growth, operating cost, bank size and real loan growth rate had large impact on the problematic lending. Further the study also suggested that the loan borrower had to be screened regularly in order to avoid the NPAs. Then, the huge banks lean towards great loan problems in terms of their size of operations. In addition to that, it was also found that the surplus progression loan levels and deteriorated levels of bank capital had to be much concerned for avoiding the future problems [7]. Khizer Ali, Muhammad Farhan Akhtar and Hafiz Zafar Ahmed (2011) critically examined the bank-specific and macroeconomic indicators of profitability with empirical evidence from the commercial banks of Pakistan. The correlation analysis revealed a favorable association among efficient asset management and economic growth with profitability in ROA as well as in ROE models. The profitability of the banks were affected by expanded credit risk and capitalization in the return on assets model whereby the operating efficiency inclines in increased profitability level as per the return on equity model [8]. Nutan N Thoke and Parikshit K Pachorkar (2012) piloted the correlation study of financial performance indicators in Indian public sector banks and private sector banks. The research targeted on reviewing the association between ROA and total assets, asset utilization ratio, operating efficiency ratio as well as matching the interest and other income of public and private sector banks. The correlation analysis revealed that there was direct association between the independent variables and interest income for PSBs. Further it was noted that the private sector banks were generating more other incomes than the PSBs. The results of credit deposit ratio expressed that the private sector banks were utilizing their assets to the entire level for making income than the PSBs [9]. Vighneswara Swamy (2013) inspected the determinants of bank asset quality and profitability. The research was very much keen on analyzing the influents of bank asset quality and profitability of public and private sector banks in India. The panel data techniques revealed that the size of bank was a great thing in curbing the level of NPA as it would be concentrating well on the managing proficiency. The huge sized banks had registered a healthier credit risk management with low level of NPAs. Further, it was found that the bank expansion does not affect the NPA levels of banks. In addition to that, it was also analyzed that the private and foreign banks had performed well in terms of credit risk management and NPAs whereas the public sector banks could not provide a satisfactory credit risk management and NPAs [10]. Manoj P K (2010) studied the determinants of profitability and efficiency of old private sector banks within Kerala State in India during the period 1999-2000 to 2008-09, by using the econometric model, regression analysis, ratio analysis and net interest margin. The study was keen on influents of profitability and efficiency of

old private sector banks with regard to Kerala. The results revealed that the banks should aim at improving their non-interest income by means of expanding the technology which in turn impacts the profitability of the banks. Further the investments in government securities had to be minimized in order to ensure better credit risk management [11]. Viplaw Kishore Pandey and Harmeet Kaur (2012) interrogated the NPA in Indian banking sector. The correlation analysis revealed that there was a sense of direct relationship between NPA and the advances. The management of NPAs was very much effective in PSBs than that of the Private Sector Banks and the level of NPAs was considered as an impacting factor of resource utilization, quality of assets and credit risk. Further it was noted that the NPAs showed an increasing trend mainly due to the lending of loans to real estate businesses and personal loan to the customers. In addition, it was also found that all these huge deviations in NPA levels were due to the competition among the public and private sector banks only [12].

Therefore, this paper has made an attempt to find out the subsisting research gaps and aimed at minimizing the same with regard to the New Private Sector Banks in India by considering selected industry-specific and macroeconomic variables based on the past literature, articles, banking data, books, journal publications, etc.

## B. RESEARCH DESIGN

The 3<sup>rd</sup> chapter completely deals with the objectives, hypothesis, technique, tools applied and the anticipated association among the Regressors and regressands of the research.

### B.1. OBJECTIVES OF THE RESEARCH

- To examine the association between the institutional-specific and macroeconomic indicators on the NPAs of New Private Sector Banks in India.
- To analyze the impact of institutional-specific and macroeconomic indicators on the NPAs of New Private Sector Banks in India.

### B.2. HYPOTHESES STATEMENT

$H_0$ : Institutional-specific and macroeconomic indicators are not significantly associated with the NPAs of New Private Sector Banks in India

$H_a$ : Institutional-specific and macroeconomic indicators are significantly associated with the NPAs of New Private Sector Banks in India.

### B.3. RESEARCH METHODOLOGY

The study has been made based on the available data for the 7 New Private Sector Banks in India. The data has

been collected and compiled for a period of 12 years ranging from 2004-05 to 2015-16. The source of data is RBI's website and the other reports published by RBI as well as the other banks from time to time. The data has been analyzed by applying the statistical tools such as:

- Descriptive Statistics
- Multiple Correlation
- Augmented Dickey Fuller Test
- Granger Causality Test and
- Johansen Co-integration Test

TABLE I

STATEMENT OF LIKELY ASSOCIATION BETWEEN THE REGRESSAND AND REGRESSORS

Dependent Variable	Independent Variables	Expected Sign.
GNPATA – Gross Non-Performing Assets to Total Advances	MS – Logarithm of Money Supply	Positive
	GDPGR – Logarithm of Gross Domestic Product Growth Rate	Negative
	IR – Logarithm of Inflation Rate	Positive
	UR – Logarithm of Unemployment Rate	Positive
	CAR – Logarithm of Capital Adequacy Ratio	Negative
	CRR – Logarithm of Cash Reserve Ratio	Negative
	PLR – Logarithm of Prime Lending Rate	Positive
	RR – Logarithm of Repo Rate	Positive
	RRR – Logarithm of Reverse Repo Rate	Negative
SLR – Logarithm of Statutory Liquidity Rate	Negative	

## C. RESULTS AND DISCUSSION

This 4<sup>th</sup> part of the study consolidates the results derived from various statistical and econometric tools such as descriptive statistics, multiple correlation analysis, augment dickey fuller unit root test, granger causality test and johansen co-integration test. Based on the research findings, valid suggestions will be given to the New Private Sector Banks in India which might help them in improvising the future performance.

TABLE II

DESCRIPTIVE STATISTICS ANALYSIS OF INSTITUTIONAL-SPECIFIC AND MACROECONOMIC INDICATORS WITH THE GROSS NON-PERFORMING ASSETS OF NEW PRIVATE SECTOR BANKS IN INDIA

Variables	Minimum	Maximum	Mean	Standard Deviation
Gross Non-Performing Assets to Total Advances (GNPATA)	-0.9500	1.2300	0.2184	0.4017
Capital Adequacy Ratio (CAR)	0.9800	1.3100	1.1672	0.0770
Cash Reserve Ratio (CRR)	0.6000	0.8800	0.6973	0.0878
Prime Lending Rate (PLR)	0.9800	1.1200	1.0384	0.0448
Repo Rate (RR)	0.7000	0.9300	0.8379	0.0743
Reverse Repo Rate (RRR)	0.5400	0.9200	0.7532	0.1141
Statutory Liquidity Ratio (SLR)	1.3300	1.4000	1.3741	0.0271
Money Supply (MS)	5.7800	6.3900	6.1314	0.1846
Gross Domestic Product Growth Rate (GDPGR)	0.7500	0.9800	0.8831	0.0721
Inflation Rate (IR)	0.6900	1.1800	0.8816	0.1456
Unemployment Rate (UR)	0.8300	1.0300	0.9311	0.0628

The Table 2 explains the results of descriptive statistics analysis of the 7 New Private Sector Banks considered for the present study over a period of 12 years ranging from 2004-05 to 2015-16. The summary of the descriptive statistics denotes the extent of changes in the institutional-specific variables as well as the macroeconomic variables and the amount of impact it has on the Gross Non-Performing Assets to Total Advances of the banks. The Mean Value is topped by Money Supply (6.1314) followed by Statutory Liquidity Ratio (1.3741), Capital Adequacy Ratio (1.1672) and Prime Lending Rate (1.0384). (The value of Mean for MS is 6.1314 whereas the standard deviation stood at 0.1846, denoting that

the MS can influence the GNPATA to the tune of 0.1846% which being the most among all other independent variables.)

In addition, the MS has the highest standard deviation of 0.1846% which explains the amount of deviation in the study period of 12 years. During the said period the Minimum and Maximum value of MS stood at 5.78 and 6.39 which is the most among all study variables. In this study the Gross Non-Performing Assets to Total Advances has been considered as dependent variable which exhibits the soundness of banks in lending the money to their customers over the study period and compared with a set of 6 Institutional-specific variables and 4 Macroeconomic variables.

TABLE III

MULTIPLE CORRELATION ANALYSIS OF INSTITUTIONAL-SPECIFIC AND MACROECONOMIC VARIABLES

Variables	CAR	CRR	PLR	RR	RRR	SLR	GDPGR	IR	MS	UR
CAR	1									
CRR	-0.1833	1								
PLR	-0.0836	0.5605	1							
RR	-0.0248	-0.1860	-0.4942	1						
RRR	-0.0230	-0.3424	-0.6167	0.9356	1					
SLR	-0.3070	0.8007	0.5377	-0.3792	-0.5141	1				
GDPGR	-0.3365	0.7512	0.1880	-0.1039	-0.1489	0.5593	1			
IR	0.2588	0.2390	0.6761	-0.3338	-0.3976	0.2916	-0.2477	1		
MS	0.5308	-0.5846	-0.4609	0.3685	0.4421	-0.8650	-0.4813	-0.0277	1	
UR	0.3578	-0.0906	0.0954	-0.7463	-0.7184	0.0900	-0.2844	0.3884	0.0826	1

The above table summarizes the relationship that exists between the Institutional-specific and Macroeconomic variables considered for the study which will be helpful in determining its impact on the Gross Non-Performing Assets to Total Advances of New Private Sector Banks in India. The

result of multiple correlation analysis portrays the association that exists among the study variables, the degree of relationship and the extent of its impact on other variables also (Nature of Correlation). In this study, E-Views 9 software has been used in order to run the correlation and to determine

the amount of association that exists among the various study variables. The correlation for RR with RRR (0.9356) is very high followed by CRR with SLR (0.8007) and CRR with GDPGR (0.7512). Thus, the results ensured that both the

institutional-specific and macroeconomic variables had a good amount of association with the GNPATA of New Private Sector Banks in India.

TABLE IV

AUGMENTED DICKEY FULLER UNIT ROOT TEST RESULTS OF GROSS NON-PERFORMING ASSETS TO TOTAL ADVANCES AND INSTITUTIONAL-SPECIFIC VARIABLES

Variables	Augmented Dickey Fuller Test			
	Level	First Difference	Second Difference	Integration Order
GNPATA	-2.8385	-7.6741	-9.8656	I
CAR	-0.0504	-10.4663	-7.2874	I (1)
SLR	-0.4050	-4.2034	-9.9207	I (1)
CRR	-0.9280	-4.5063	-16.5533	I (1)
RR	-0.0842	-9.9933	-11.2691	I (1)
RRR	-0.2689	-12.9967	-11.7263	I (1)
PLR	-0.2867	-8.1631	-9.0884	I (1)

Table – 4 demonstrates the results of Augmented Dickey Fuller Test for the Institutional-specific variables with that of the Gross Non-Performing Assets to Total Advances of New Private Sector Banks in India. The result of ADF test clearly explains the non-existence of unit root among the given variables. All the 6 institutional-specific variables such as

CAR, SLR, CRR, RR, RRR and PLR are said to be stationary (no unit root) at first difference with the integration order of I (1). Thus, it ensures that the selected institutional-specific variables are suitable for application of further statistical tools like Granger Causality Test (GCT) and Johansen Co-integration Test (JCT).

TABLE V

AUGMENTED DICKEY FULLER UNIT ROOT TEST RESULTS OF GROSS NON-PERFORMING ASSETS TO TOTAL ADVANCES AND MACROECONOMIC VARIABLES

Variables	Augmented Dickey Fuller Test			
	Level	First Difference	Second Difference	Integration Order
GNPATA	-2.8385	-7.6741	-9.8656	I
IR	-0.8390	-5.0983	-8.8481	I (1)
GDPGR	-0.3417	-3.7133	-18.7031	I (1)
UR	0.0397	-9.5183	-9.7941	I (1)
MS	0.2540	-9.9959	-8.9234	I (1)

The above Table (5) depicts the results of Augmented Dickey Fuller Test between the Gross Non-Performing Assets to Total Advances and Macroeconomic variables considered for the study. All the 4 macroeconomic variables are said to be stationary at 1<sup>st</sup> difference with the Integration Order of I(1) with GNPATA and also makes sure that these variables are ready to apply the other statistical tools like GCT, JCT, etc. Further it can be concluded that there is no such problem of unit root and all the selected macroeconomic variables such as IR, GDPGR, UR and MS are said to be non-stationary.

GNPATA does not Granger Cause SLR	1.9048	0.1563	Rejected H <sub>0</sub>
SLR does not Granger Cause GNPATA	1.1862	0.3113	Rejected H <sub>0</sub>
GNPATA does not Granger Cause CRR	2.0164	0.1406	Rejected H <sub>0</sub>
CRR does not Granger Cause GNPATA	0.5780	0.5636	Rejected H <sub>0</sub>
GNPATA does not Granger Cause RR	0.4096	0.6655	Accepted H <sub>0</sub>
RR does not Granger Cause GNPATA	2.2200	0.1160	Rejected H <sub>0</sub>
GNPATA does not Granger Cause RRR	0.3736	0.6896	Accepted H <sub>0</sub>
RRR does not Granger Cause GNPATA	2.7216	0.0725	Rejected H <sub>0</sub>
GNPATA does not Granger Cause PLR	0.3954	0.6749	Accepted H <sub>0</sub>
PLR does not Granger Cause GNPATA	1.5966	0.2097	Rejected H <sub>0</sub>

TABLE VI

GRANGER CAUSALITY TEST RESULTS OF GROSS NON-PERFORMING ASSETS TO TOTAL ADVANCES AND INSTITUTIONAL-SPECIFIC VARIABLES

Null Hypothesis	F – Statistic	Probability	Inference
GNPATA does not Granger Cause CAR	0.7558	0.4733	Rejected H <sub>0</sub>
CAR does not Granger Cause GNPATA	0.1785	0.8369	Accepted H <sub>0</sub>

Table VI explains the relationship that exists between the Institutional-specific variables and the Gross Non-Performing Assets of New Private Sector Banks in India. The Granger Causality Test helps in finding whether the changes in one variable affects the other variable or not. The relationship that exists among the study variables can be identified and the value of one variable influencing the value of other variable can also be examined. In this GCT, the F-Statistic and the Probability value are compared in order arrive at a decision whether one variable is helpful in determining the other variable or not. The results of GCT clearly states that the institutional-specific variables such as SLR, CRR, RR, RRR and PLR do granger cause the occurrence of GNPATA whereas the CAR alone does not granger cause the GNPATA of New Private Sector Banks in India.

TABLE VII

GRANGER CAUSALITY TEST RESULTS OF GROSS NON-PERFORMING ASSETS TO TOTAL ADVANCES AND MACROECONOMIC VARIABLES

Null Hypothesis	F – Statistic	Probability	Inference
GNPATA does not Granger Cause IR	0.6440	0.5282	Rejected H <sub>0</sub>
IR does not Granger Cause GNPATA	2.2431	0.1135	Rejected H <sub>0</sub>

TABLE VIII

JOHANSEN CO-INTEGRATION TEST RESULTS OF GROSS NON-PERFORMING ASSETS TO TOTAL ADVANCES AND INSTITUTIONAL-SPECIFIC VARIABLES

BIVARIATE COINTEGRATION TEST OF NEW PRIVATE SECTOR BANKS						
Pairwise Co-integration	Eigen Value	Trace Statistic	Critical Value (5%)	Max-Eigen Statistic	Critical Value (5%)	Interpretation
GNPATA – CAR	0.1851	22.0425	15.4947	15.7648	14.2646	Co-integrated
	0.0783	6.2776	3.8415	6.2776	3.8415	
GNPATA – CRR	0.2008	24.4427	15.4947	17.2607	14.2646	Co-integrated
	0.0891	7.1821	3.8415	7.1821	3.8415	
GNPATA – PLR	0.3209	36.7439	15.4947	29.7994	14.2646	Co-integrated
	0.0862	6.9446	3.8415	6.9446	3.8415	
GNPATA – RR	0.5731	71.8581	15.4947	65.5430	14.2646	Co-integrated
	0.0787	6.3150	3.8415	6.3150	3.8415	
GNPATA – RRR	0.4848	57.5430	15.4947	51.0667	14.2646	Co-integrated
	0.0807	6.4763	3.8415	6.4763	3.8415	
GNPATA – SLR	0.1853	22.2957	15.4947	15.7792	14.2646	Co-integrated
	0.0811	6.5165	3.8415	6.5165	3.8415	

Table VIII elucidates the results of Johansen Co-integration Test for the Institutional-specific variables with the Gross Non-Performing Assets to Total Advances of New Private Sector Banks in India. This JCT measures the relationship that exists between the study variables and ensures the co-integration among them. For determining the co-integration, the Trace Statistic and Max-Eigen Statistic values are compared with

GNPATA does not Granger Cause GDPGR	6.0161	0.0038	Rejected H <sub>0</sub>
GDPGR does not Granger Cause GNPATA	0.1518	0.8595	Accepted H <sub>0</sub>
GNPATA does not Granger Cause UR	0.6327	0.5341	Rejected H <sub>0</sub>
UR does not Granger Cause GNPATA	3.9001	0.0247	Rejected H <sub>0</sub>
GNPATA does not Granger Cause MS	0.4571	0.6349	Accepted H <sub>0</sub>
MS does not Granger Cause GNPATA	0.4333	0.6500	Accepted H <sub>0</sub>

Table VII indicates the results of Granger Causality Test which examines the relationship that exists between the dependent and independent variables of the study. The results of GCT clearly points out that the macroeconomic variables such as IR and UR do granger cause the GNPATA whereas the remaining 2 variables such as GDPGR and MS does not granger cause the GNPATA of New Private Sector Banks in India. This ensures that there is a considerable amount of relationship which exists between IR and UR with GNPATA whereas on the other hand, the variables such GDPGR and MS has got nothing to do with the GNPATA over the study period of 12 years from 2004-05 to 2015-16.

their corresponding Critical Values at 5%. The above result clearly states that all the 6 institutional variables such as CAR, CRR, PLR, RR, RRR and SLR are having higher trace statistic and max-eigen statistic values when compared to that of their corresponding critical values at 5%. Hence, it is concluded that all the institutional-specific variables are co-integrated with the GNPATA of New Private Sector Banks in India.

TABLE IX  
JOHANSEN CO-INTEGRATION TEST RESULTS OF GROSS NON-PERFORMING ASSETS TO TOTAL ADVANCES AND MACROECONOMIC VARIABLES

BIVARIATE COINTEGRATION TEST OF NEW PRIVATE SECTOR BANKS						
Pairwise Co-integration	Eigen Value	Trace Statistic	Critical Value (5%)	Max-Eigen Statistic	Critical Value (5%)	Interpretation
GNPATA – MS	0.2179	25.2789	15.4947	18.9281	14.2646	Co-integrated
	0.0792	6.3508	3.8415	6.3508	3.8415	
GNPATA – GDPGR	0.3766	43.0137	15.4947	36.3876	14.2646	Co-integrated
	0.0825	6.6261	3.8415	6.6261	3.8415	
GNPATA – IR	0.3636	42.5347	15.4947	34.7972	14.2646	Co-integrated
	0.0956	7.7375	3.8415	7.7375	3.8415	
GNPATA – UR	0.4539	53.3072	15.4947	46.5802	14.2646	Co-integrated
	0.0837	6.7270	3.8415	6.7270	3.8415	

Table 9 represents the results of Johansen Co-integration Test for the Macroeconomic variables with the Gross Non-Performing Assets to Total Advances of New Private Sector Banks in India. The JCT ensures the co-integration among the study variables. The above results clarifies that all the 4 macroeconomic variables such as MS, GDPGR, IR and UR are co-integrated with the GNPATA and ensures that there is high amount of relationship exists among the selected variables over the study period of 12 years from 2004-05 to 2015-16.

#### D. SUMMARY OF FINDINGS

The research findings can be summarized as follows:

1. Descriptive statistics stated that the Money Supply (6.1314) has the highest mean value lined by Statutory Liquidity Ratio (1.3741), Capital Adequacy Ratio (1.1672) and Prime Lending Rate (1.0384).
2. The institutional-specific variables such as RR and RRR had high amount of correlation between them (0.9356) whereas the correlation for CRR with SLR is 0.8007 and for CRR with GDPGR is 0.7512.
3. The ADF Test results denoted that all the 6 institutional-specific variables and 4 macroeconomic variables are stationary at 1<sup>st</sup> difference with the integration order of I(1).
4. The results of GCT clearly states that the institutional-specific variables such as SLR, CRR, RR, RRR and PLR do granger cause the occurrence of GNPATA whereas the CAR alone does not granger cause the GNPATA of New Private Sector Banks in India.
5. Further the results of GCT points out that the macroeconomic variables such as IR and UR do granger cause the GNPATA whereas the remaining 2 variables such as GDPGR and MS does not granger cause the GNPATA of New Private Sector Banks in India.
6. Finally the JCT results also indicated that all the 6 institutional-specific variables and 4 macroeconomic

variables are co-integrated with the GNPATA of New Private Sector Banks in India.

#### E. SUGGESTIONS

After the successful completion of the study, the following suggestions are recommended to the New Private Sector Banks in India.

1. All the 7 New Private Sector Banks in India are performing well inspite of their level of Non-Performing Assets. But, they must understand the importance of institutional-specific and macroeconomic variables in contributing to their NPAs.
2. The banks have to follow the rules and regulations amended by the government strictly in order to bring down their level of NPAs in future.
3. The banks have to watch out for the movements in macroeconomic variables such as Money Supply, Gross Domestic Product Growth Rate, Inflation Rate and Unemployment Rate closely in order to take preventive measures for bringing down the level of NPAs.
4. Apart from that, all the 6 institutional-specific variables such as Capital Adequacy Ratio, Cash Reserve Ratio, Prime Lending Rate, Statutory Liquidity Ratio, Repo Rate and Reverse Repo Rate also has a reasonable impact on the Gross Non-Performing Assets to Total Advances of the New Private Sector Banks which they have to consider in order to improve their financial efficiency in future.

#### II. CONCLUSION

The research has been carried out by considering the 6 institutional-specific variables and 4 macroeconomic variables as independent and the gross non-performing assets to total advances as the dependent variable in order to determine the financial efficiency of 7 New Private Sector Banks in India. The data has been collected for a period of 12 years ranging

from 2004-05 to 2015-16. Further the data was collected from various sources such as RBI website, journals, articles, thesis, and newspaper, etc. On the other hand, the data was analyzed by means of statistical as well as the econometric tools such as descriptive statistics, multiple correlation analysis, augmented dickey fuller test, granger causality test and johansen co-integration test which ensured the relationship among the various study variables.

Based on the research findings, valid suggestions has been given to all the 7 New Private Sector Banks in India which will help them in improving their financial efficiency in future by way of minimizing their level of non-performing assets to total advances.

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